



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
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BOSTON, MASSACHUSETTS 02114-2023

November 2, 2005

Lonnie Monaco (monacolj@efane.northdiv.navy.mil)
Engineering Field Activity Northeast, Naval Facilities Engineering Command
Code 1821/LM, 10 Industrial Highway, Mailstop 82
Lester, PA 19113-2090

Re: Sites 1, 3, and Eastern Plume, Monitoring Event 25 (September 2004) Report, dated July 2005., Naval Air Station Brunswick, Maine

Dear Mr. Monaco:

Pursuant to § 6 of the Naval Air Station Brunswick, Maine Federal Facility Agreement dated October 19, 1990, as amended (FFA), the Environmental Protection Agency has reviewed the subject document and comments are below:

General Comments:

1. Results from Event 25 are generally consistent with recent trends (see, e.g., Appendix C), particularly for VOCs. No anomalies of concern are noted.
2. The recommendations presented in section 3.1 generally are well motivated, and most are endorsed. Please see Specific Comment related to "background" well MW-1104 for the MNA assessment, and others for MW313area, etc..

Specific Comments:

3. **p. 1-5, sec. 1.4:** The interpreted potential surfaces shown for shallow (Figure 6) and deep (Figure 7) overburden groundwater are incorrect in the neighborhood of the slurry wall. The interpretations ignore the presence of the impermeable barrier, and attempt to contour a continuous surface. However, due to the presence of the wall, it is expected that the potential is discontinuous (e.g., it jumps from high values just upgradient of the wall (e.g., MW-201R at 45.98 ft msl) to lower values immediately inside the wall (e.g., EP-19 at 31.10 ft msl)). Also, all contours should intersect the wall perpendicular to the impermeable surface. The expected result would show flow diverging around the wall on the outside, and a "plateau" inside. The average condition likely shows a very slight overall gradient from north to south within the wall that balances weak upward seepage from beneath the enclosed area. Please revise the contour maps to account for the impermeable barrier.
4. **p. 1-5, sec. 1.4:** The reported water level for EW-06 (34.17 ft msl; Table 3) seems unlikely. It is more than 3 ft higher than the levels in surrounding wells. Insofar as this

area is beneath an impermeable cap and within the slurry wall, it is difficult to imagine a mechanism by which the water level would be elevated to this extent. Other than a simple error in the field measurement, it is possible that the existing well survey is in error or the well has settled. It may be necessary to resurvey the well if anomalous readings persist. (It is noted that the elevation recorded in ME 24 was 34.44 ft msl, suggesting that the problem is not due to a one-time measurement error.)

5. **p. 1-6, sec. 1.5, first bullet:** It might be noted that only *select* samples were analyzed for 1,4-dioxane. Additional wells across the plume to characterize the nature and extent of 1,4-dioxane must be added to the LTMP. EPA looks forward to discussing this issue at the next technical meeting.
6. **p. 2-1, sec. 2.1:** The text states, "Although not expected to be significant, the calculated mass of VOCs removed is likely to be greater than shown because the total VOC results do not include the VOCs recorded in the treatment plant influent." Is the effluent analyzed only for nine VOCs, while the influent is analyzed for a broader suite, allowing for a discrepancy? Please clarify.
7. **p. 2-6, sec. 2.3.2, MW-217B:** The report notes correctly that the elevated metals at MW-217B are likely associated with turbidity (the well purged dry, and the sample was described as cloudy). It is also worth noting that the suite of elevated metals suggests possible corrosion of the stainless steel pump; the elevated metals specifically include Cr (394 micrograms per liter), Ni (305 micrograms per liter), and cobalt (21.3 J micrograms per liter). This particular group of metals is characteristic of stainless steels, and is unlikely to occur naturally. Note, too, that the environment in this well is likely highly corrosive due to upward leakage of saltwater from the underlying marine clay. Sodium is extremely high (131 mg/L), and it can be expected that chloride is correspondingly very high. It is possible that trace metals corroded from the stainless steel pump are sorbed onto hydrous ferric oxides (HFO) on particulate, resulting in the association with turbid samples. The groundwater sampled at MW-217B is reducing (ORP -37 mV), which will also result in dissolution of HFO and mobilization of sorbed trace metals to solution.
8. **p. 2-6, sec. 2.3.2, MW-218:** This well shows some indications of stainless steel corrosion, similar to MW-217B. Cr (36.9 ppb), Ni (25.9 J ppb), and Co (2.3 J ppb) are elevated, although below their respective MCLs. The sample was again turbid (54 NTU), and reducing conditions were encountered (ORP -69.1 mV). Sodium was again extremely high (244 mg/L), and it can be inferred that chloride is similarly very high, resulting in a corrosive environment.
9. **p. 2-9, sec. 2.3.3, MW-311:** The plot of the extraction rate for EW-2A along with VOC concentrations for nearby monitoring wells is welcome. As noted in the text, this offers helpful insight into fluctuations in VOC concentrations. For example, it is notable that total VOCs at MW-332 (mid-depth) jumped significantly in spring 2005, following a short interval of no pumping at EW-2A.
10. **p. 2-10, sec. 2.3.3, MW-313:** The statement regarding 1,4-dioxane ("This is the second detection ...") seems to be out of context. Please change to, "1,4-dioxane was detected at 93.8 micrograms per liter. This is the second detection ...," or similar.

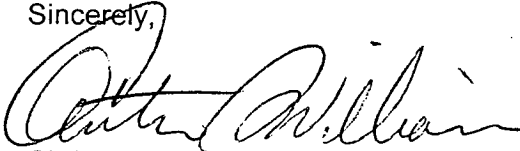
11. **p. 2-10, sec. 2.3.3, MW-331:** The trend plot for low-flow sampling results shown in Appendix C is somewhat misleading with respect to total VOCs. Total VOCs are shown as zero, but this is presumably because the sample was not analyzed for VOCs (other than 1,4-dioxane). Based on the mid-depth diffusion sample results (total VOCs 722 ppb), total VOCs in the low-flow sample are unlikely to be zero. The plot should not display a total VOC results for 2004, but should retain the 1,4-dioxane results as a separate trend, as shown.
12. **p. 2-11, section 2.3:** Navy should continue to analyze the Eastern Plume Raw Influent for 1,4-dioxane on a regular basis.
13. **p. 2-22, sec. 2.5.1:** The text notes that MW-1104 was selected as a "background" well for the MNA assessment, particularly with respect to chloride and alkalinity. At a previous meeting between Navy, its contractors, and state and federal regulators, there was some discussion of using several wells believed to be outside the plume footprint to provide a more representative "background" condition. This concept should be considered in the future.
14. **p. 2-25, sec. 2.5.1, Ferrous Iron:** The discussion of results for ferrous iron notes that uncertainty is introduced by analyzing for reduced iron in the laboratory because oxidation may occur in transit. There is some suggestion of this phenomenon in the data. The attached figure shows lab-measured total iron versus field-measured ORP, and shows that elevated total iron (e.g., >2 mg/L) was detected primarily in samples from reducing conditions (e.g., -100 to -200 mV). The single exception is the sample from MW-313 (ORP 221 mV, Fe 3.69 mg/L); however, this sample was turbid (80 NTU), so there is an likely explanation for the elevated iron under oxidizing conditions. Although the elevated total iron is consistent with the observed reducing conditions at MW-207AR, MW-230A, MW-305, and MW-334, the reduced iron analyses at these wells ranged only from ND (<0.1 mg/L) to 0.26 mg/L. This suggests that at least some of the total iron measured may have been oxidized in transit.
15. **p. 2-26, sec. 2.5.1, TOC and BTEX:** The discussion notes that the availability of organic carbon may limit the reduction of the chlorinated solvents, which indeed seems to be supported by the data. The text refers to, "... the absence of reduced VOC daughter products." Presumably, this statement refers to the lack of daughters beyond the first-level decay products 1,1-DCA and cis-1,2-DCE, which are observed. Please revise for clarity.
16. **p. 3-1, sec. 3.1, first bullet:** It is recommended that the first sentence be edited for clarity; for example, "Concentration trends from monitoring wells located within the body of the Eastern Plume appear to be relatively stable, suggesting limited migration. The inferred plume above MCLs (Figures 12 and 13) has remained relatively stable compared to the Monitoring Event 24 inferred plume area." However, the results of the screening level field work conducted by EPA and MeDEP this summer/fall suggest that migration is occurring into the Mere Brook /Merriconeag Stream confluence area. EPA looks forward to discussing follow-on actions (installation of monitoring wells/extraction wells) with the Navy at the next technical meeting.
17. **p. 3-1, sec. 3.1, first bullet:** The text states, "... continued increases in concentration at MW-331 in 2004 have been noted" The trend plot provided in Appendix C for

the mid-depth diffusion samples shows a more-or-less continuous decrease in concentrations at MW-331 since 2002. Also, the text states that MW-331 exhibited the highest total VOCs in this round, while the tables provided in Appendix B show total VOCs at P-106 (835 ppb) to be slightly higher than those at MW-331 (722 ppb). Please check for consistency. It is agreed that the data suggest that a domain of elevated CVOCs is moving downgradient, although the trend plot shown in Appendix C would imply that the maximum of this "blob" has already moved past MW-331.

18. **p. 3-2, sec. 3.1, first bullet:** Please change, "Surface water sample SW-12 noted decreasing concentration detection of TCE for the first time in May 2003 ..." to, "Surface water sample SW-12 detected TCE for the first time in May 2003 ..."
19. **p. 3-3, sec. 3.1, last bullet:** The report recommends that MW-1104 be replaced as a "background" well for the MNA assessment. It is agreed that there are significant questions regarding MW-1104 in this role. At a previous meeting, there was some discussion of using a number of existing wells located outside the plume footprint to provide a more robust set of "background" values. This deserves further discussion.

If you have any questions with regard to this letter, please contact me at (617) 918-1384.

Sincerely,



Christine A.P. Williams, RPM
Federal Facilities Superfund Section

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